The chief alterations and amendments which appear in this edition of the 'Manual' will be gathered from what has been already said, and from a study of the preceding analysis. It only remains for us to observe that there is no other work of the kind in which so great pains have been taken to bring the nomenclature of our English plants into conformity with that adopted on the Continent; and it will be seen that not a few of the changes which appear in the edition now before us have been introduced with this aim. We must also remark that in no other English book can we find the same care bestowed on the discrimination of closely allied species and varieties; and, whatever be thought of the respective value of the different forms, no one can doubt the importance of a careful and discriminating study of varieties, inasmuch as it is only by this means that we can hope to attain to a more exact knowledge of species.

It is by a careful and judicious attention to matters such as these that Professor Babington's 'Manual' has become identified with the progress of British botany; and we have no hesitation in saying that the present edition is in every respect calculated to sustain the high reputation in which its author is so deservedly held.

British Conchology; or, an Account of the Mollusca which now inhabit the British Isles and the surrounding Seas. Volume I. *Land and Freshwater Shells.* By JOHN GWYN JEFFREYS, F.R.S., F.G.S. &c.

Nine years have elapsed since the publication of Forbes and Hanley's 'History of British Mollusca'—a period brief indeed in the history of a science, but long enough to have added many species of Mollusca to our fauna, and of these no sufficient description has as yet been given. The elaborate treatise to which reference has just been made will probably remain for some time the chief illustrated work upon the subject. The high price, however, at which it was necessarily published unfortunately placed it beyond the reach of very many, who have thus been hitherto debarred from following up the study of British Conchology; while its bulk has stood in the way of its utility, and the student has felt the want of a portable volume which should be his companion at the sea-side. The aim of the author whose Manual we are about to review is to supply this want, as well as to bring the history of the Mollusca up to our present state of knowledge, and no one has equal facilities for undertaking and satisfactorily performing the task. Possessed of an unrivalled and well-nigh perfect collection of British shells, and having, moreover, a first-rate conchological library, Mr. Jeffreys has those materials at his own command which previous writers have been compelled to glean from various sources, or search for through the cabinets of many widely scattered collectors. Moreover, he has had upwards of thirty years' close study of his subject, and is thus thoroughly master of it, as is evidenced in the easy flowing style which characterizes that portion of his work which is now before us.

The volume is divided into two parts,—the first consisting of an

Introduction, the second containing a descriptive account of the British Land and Freshwater Mollusca.

The Introduction, comprised in six chapters, furnishes much valuable information condensed into a small compass. It has evidently been drawn up with much care; and the history, habits, structure, and economy of the Mollusca are well handled. The following extracts will give our readers a fair idea of the contents. On hybridism we find the following information :—

"Although many surmises have from time to time been hazarded as to the production of abnormal forms of Mollusca by means of an unnatural union between individuals of different species, the only direct experiments or observations that appear to have been published on the subject have been made by French naturalists. M. Gassies, in his descriptive Catalogue of the Land and Freshwater Mollusca found near Agen, mentioned several cases of what he calls 'accouplements adultérins,' which he had observed between individuals of *Helix virgata* and *Helix Pisana,* as well as between those species and *Bulimus decollatus.* M. Gassies enclosed the snails, during a thunderstorm, in a vessel covered with metallic gauze; and he believed that the electricity with which the air was then charged induced the unnatural union. Great care appears to have been taken to prevent any error in the result, by selecting individuals which had not been previously fertilized, and keeping them, after fecundation, separate from any others. The product of these unions was as follows: the young of *H. Pisana* had perfectly white shells, their mother having the usual coloured bands; and the young of *H. virgata* had shells of a darker colour than that of their mother. In the other case, the product of the Helices which had been coupled with the *Bulimus* was various. Many had shells which were almost scalariform; the shells of others were pyramidal; but the greater part of them had shells exactly like that of their mother. The product of the *Bulimus* did not differ from their maternal form. M. Gassies had also observed the product of a union between *Helix nemoralis* and *H. hortensis,* in which the colour of the lips of their shells in each case varied indifferently from brown or rose-colour to milk-white. Prof. Lecoq and M. Miergue have celebrated the voluntary nuptials between individuals of *Helix nemoralis* and *H. aspersa,* as well as between *Pupa cinerea* and *Clausilia papillaris*; but these unions do not appear to have been blessed with any offspring."

To these instances of hybridism we may add that we have seen some hybrids which had been bred between *Helix Pomatia* and *H. aspersa* by an English conchologist.

Few subjects have greater interest than the wonderful provision which nature makes for the reproduction of lost members among the lower divisions of the animal kingdom. The following account is given of instances of this phenomenon as evidenced among the Mollusca: "Some Mollusca which had been accidentally deprived of their feet, tentacles, eyes, and even their entire heads, have been known to reproduce them. Nearly a century ago, the experiment of decapitating unfortunate slugs and snails was conducted on a wholesale scale on the Continent, and every philosopher was anxious to cut off a head. Even the great Voltaire followed the universal fashion; and his experiences were published in the 'Questions sur l'Encyclopédie.' In these he mentions having operated on twenty brown slugs and a dozen snails; and he afterwards records with great pride and satisfaction 'mes Limaces' and 'mes Escargots' showing their budding heads and horns, and doing as well as might be expected under the circumstances." Accident some years ago enabled us to verify the observations of Voltaire, Müller, and others upon this subject. Unaware at that time of the wonderful tenacity of life in the Helices, and being desirous of examining the jaws of *H. aspersa*, we suddenly decapitated a snail, while crawling, with a single stroke of a penknife. We believed, in doing this, that we had adopted a plan of killing the snail which would result in instantaneous death, while the mode of death was also best suited to our immediate purpose. The shell containing the carcase was thrown from the open window into the garden, while the head was dissected, and the jaws extracted and mounted. Nothing more was thought of the matter until, about six weeks subsequently, we lighted, while gardening, upon the identical snail-shell, which was easily recognizable in consequence of a repair, and to our astonishment noticed a thin filmy epiphragm closing the mouth of the shell. The mollusk was still alive; and on tempting it out by immersion in tepid water, the headless trunk was protruded from the shell. The poor animal's neck was healed over, and we found that we had been unintentionally guilty of a barbarous act of mutilation. We were, however, of course extremely interested in the result, and the snail was carefully kept for future observation. It lived for a year and two or three months. During this time it was occasionally dipped in milk, with the hope that nourishment might thus be imbibed through the pores of the skin. Under this stimulus, the snail would protrude its poor guillotined remains from the shell; there were, however, but faint signs of reproduction. The last time it was seen alive, the head was represented by a knob-formed projection, on which two minute tubercular eminences represented the upper antennæ.

The author gives a brief analysis of the various solutions which have been offered of the much-vexed question of the means by which the burrowing Mollusca penetrate stone, wood, cork, and other substances, and then proceeds to propound a new theory—new, that is, to modern times,—which we give to our readers without comment.

"I profess myself to be a follower of Sellius," a Dutch philosopher who wrote a learned treatise on the Ship-worm about a hundred and thirty years ago; "and I am convinced that the sole instrument of perforation, by the Mollusca, of stone, wood, and other substances is in every case their foot, or muscular disk, which is closely applied to the concave end of the hole, and is constantly supplied with moisture through the glandular tissues of the body. The strength of this organ may be easily tested by any one who tries to remove a limpet from its native rock, after having touched it, and thus given it notice of his intention. By this simple yet gradual process, the fibres of wood or grains of sandstone may easily be detached or disintegrated, time and patience being allowed for the operation. When it is considered that the hole made by an adult *Pholas* or *Saxicava* is only a few inches deep, and that an aged *Patella* scarcely penetrates a quarter of an inch into a limestone-rock, there can scarcely be a question that these mollusks have abundance of time to effect their purpose. It is said that even the hardest marble is not proof against the softest impressions, and that the big toe of St. Peter's statue in the Vatican has been nearly worn away by the lips of fair devotees. The osculatory process is not unlike that of suction."

In the second portion of the work a uniform plan has been adopted. The animal is first described, then the shell and its varieties; and these descriptions are followed by a commentary upon the range, habits, and nomenclature of the species in question. The different parts of the animal and shell are also invariably characterized in the same order—a methodical plan which has great advantages, and which ought always to be adopted in descriptive works on natural history.

Mr. Jeffreys's computation of the number of our inland Mollusca is almost the same as that of Messrs. Forbes and Hanley, the former enumerating 121, and the latter 122 species. There is, however, considerable diversity as to the means by which these numbers are arrived at. The author of 'British Conchology' has struck out of the list the following Mollusca, as being either merely varietal forms or erroneously recorded species:—*Pisidium obtusale*, Pfeiffer; *Pisidium cinereum*, Alder; *Pisidium Henslowianum*, Sheppard; *Arion flavus*, Müller; *Limax brunneus*, Draparnaud; *Limax tenellus*, Müller; *Helix aperta*, Born; and *Limnæus Burnetti*, Alder: and, on the other hand, he has given admission to the following:—*Sphærium ovale*, Férussac; *Pisidium roseum*, Scholtz, separated from *Pisidium pulchellum*, Jenyns; *Anodonta anatina*, Linnæus, separated from *Anodonta cygnea*, Linnæus; *Succinea elegans*, Risso, separated from *Succinea putris*, Linnæus; *Helix concinna*, Jeffreys, separated from *Helix hispida*, Linnæus; *Vertigo Moulinsiana*, Dupuy, now first recorded as a British species, having been taken by Mr. Jeffreys in the west of Ireland; and *Vertigo alpestris*, Alder, separated from *Vertigo pygmæa*, Draparnaud. We are unable to acquiesce in many of these changes, though in the majority of instances the decision which the author has arrived at appears to be fully justified. But Mr. Jeffreys is not content with species; in this work he introduces to British conchologists no less than *one hundred and eighty-four named varieties*. It has always appeared to us that the use of names as applied to varieties is most undesirable, and therefore should only be adopted in cases where the forms are so strongly marked as either to have already been characterized as species by previous describers, or at least to be possessed of features so greatly at variance with the type that the description of the normal form would of itself be insufficient for their identification. Names, for instance, have been given, we think, rightly by Mr. Darwin to distinguish the widely different forms of the variable species of Cirripedia; and in the case of British Mollusca, they may be retained with advantage in such genera as *Pisidium, Anodonta, Littorina,* &c.; but there is surely much reason to question the advisability of introducing varietal nomenclature on slight deviations of form and colour, in the wholesale manner which we find in this volume. For instance, there are distinguishing titles given to no less than five modifications of the well-known *Cochlicopa* (*Zua*) *lubrica.* These varieties are characterized as follows:—

"Var. 1. *hyalina.* Shell greenish-white.
Var. 2. *lubricoides,* Fér. Shell smaller and more slender.
Var. 3. *viridula.* Shell shaped like the last variety, but greenish-white.
Var. 4. *fusca.* Shell smaller and thinner, reddish-brown.
Var. 5. *ovata.* Shell much smaller, and oval; spire shorter."

The views of the author are at variance with those of previous writers upon the subject of geographical distribution. It is his opinion that the provinces as constituted by Milne-Edwards, Woodward, and Forbes are all too limited in area, and that the fauna of Europe should be divided into two provinces only—*North European* and *South European.* The division between these provinces he would mark by a "line drawn in the meridian of Bordeaux, which may be assumed as an arbitrary point of demarcation between the two extremes of climate in Europe," and which roughly defines the limits of the growth of the olive in France. A table at the conclusion of the volume shows the distribution of the British land and freshwater shells in these two provinces, their presence or absence in a fossil state in the Upper Tertiary formations, and their extra-European range. The illustrations consist of nine plates, which contain figures of the animal and shell of each genus described.

In conclusion, we cordially recommend this work to conchologists, and look forward to its completion, believing that the portion which relates to the marine species is yet more required than that which is now before us, and that its publication will give a healthy stimulus to the study of the British Mollusca.

PROCEEDINGS OF LEARNED SOCIETIES.

ROYAL SOCIETY.

March 27, 1862.—Major-General Sabine, President, in the Chair.

"Theoretical Considerations on the Conditions under which the Drift Deposits containing the Remains of Extinct Mammalia and Flint-implements were accumulated; and on their Geological Age." By Joseph Prestwich, Esq., F.R.S., F.G.S.

In his former paper on the subject of the Flint-implements*, the author postponed the consideration of the theoretical questions, to

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* See Annals, ser. 3. vol. iv. p. 230, for abstract; Phil. Trans. 1860, p. 277, for the entire memoir.